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ABSTRACT

Various methods of implementing the Individually Guided Education program of the Wisconsin Research and Development Center for Cognitive Learning are listed and described. Avenues by which schools may obtain computer support for managing instruction are suggested. IGE methods are contrasted with the self-contained classroom and "file-folder" approaches to individualized education. Methods for establishing instructional groups are described, and grouping recommendations. Group decision-making by teachers in the instructional unit is emphasized. (SK)

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SOME CMI DESIGN CONSIDERATIONS TO MEET THE REQUIREMENTS OF INDIVIDUALLY GUIDED EDUCATION

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Individualization of education is not a new theme in American Education. In fact, in Colonial America individualized education was the common mode of instruction. It was not until the 1880's with an increasing population, better modes of transportation and a trend to more universal education, that the self-contained age-graded classroom came into being. However, since the end of the 19th century, educators have increasingly come to realize that group instruction on a uniform curriculum is not an effective method for dealing with individual differences in interests, learning rate, motivation and learning styles. And since the end of the 19th century, there have been many attempts at the local level to individualize instruction. The 24th yearbook of the National Society for the Study of Education, entitled Adapting the Schools to Individual Differences, which was published in 1925, describes some early attempts to individualize education in various schools. Washburne wrote in the 24th yearbook:[1]

> It has become palpably absurd to expect to achieve uniform results from uniform assignments made to a class of widely differing individuals. Throughout the educational world, there has therefore awakened a desire to find some way of adapting schools to the differing individuals who attend them..(p. X).

Fifty years have passed since the publication of the 24th NSSE Yearbook and the self-contained age-graded classroom, characterized by group teaching on a common curriculum remains, by far, the most popular way to organize the elementary school. The traditional self-contained age-graded classroom no doubt owes its current popularity

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[1]Washburne, C.W. Introduction and Summary. In Adapting the Schools to Individual Differences. Twenty-fourth Yearbook, Part II. National Society for the Study of Education, Public School Publishing Co., Bloomington, Illinois, 1925.

to the fact that management of the classroom is much easier than it would be if individualization were attempted. Implementing and monitoring the functions of testing, diagnosising, goal-setting, and prescribing to the extent necessary for a program of individualized instruction requires a considerable amount of record keeping and associated clerical work. It also requires curricula which are more adaptable to the individual needs of students than a common curriculum which is characteristic of traditional age-graded self-contained classrooms.

Although individualization of education has been a persistent theme in American education, most attempts to individualize, until recently, have been confined to individual schools or school districts. In the last ten years a number of systems have started to be developed which are intended for nation-wide implementation. For some of these "national" systems, the use of a computer for management is mandatory. For the remaining "national" systems not yet requiring a computer, its use as a management aid is being actively investigated.

In Individually Guided Education (IGE), the program of individualization of the Wisconsin Research and Development Center for Cognitive Learning, computer management is still an option. Computer management of IGE remains an option, not because there is any reservation that the computer can make a significant contribution, but rather the realization that for most IGE schools, computer support is not yet a reality.

Theoretically, there are three avenues by which schools may acquire computer support for managing instruction.

1) Schools could purchase or lease a computer for the primary purpose of implementing CMI.

2) A regional (national, state, etc.) computer network could be established to provide CMI services to IGE schools.

3) Schools could attempt to capitalize on existent computer systems which might be available to them.

The first approach, the purchase or lease of computers for the primary purpose of managing instruction, is not considered viable in terms of the current economic situation of most school districts. The second approach, a regional CMI network, becomes more and more attractive in light of technical developments in the fields of computer networks and satellite communications. And recent trends to consolidate educational computing at the state level establish a model for a supporting structure for such a network.

The design of the Wisconsin System for Instructional Management (WIS-SIM) is sensitive to the requirements of regional networks as well as the third method of acquiring computer support; that is, the capitalizing on available computer systems.

Computing power may be currently available to schools from the following five sources:

1) The School District Itself
2) Cooperative Regional Educational Service Organizations
3) Universities
4) Commercial Service Bureaus
5) Local Industries (Manufacturers, Banks, Insurance Companies, etc.)

The computer configurations which are available from these sources cover a broad spectrum from batch administrative data processing systems to on-line minicomputer systems to large-scale multiprocessing

computer systems which can concurrently support interactive terminals, on-line terminals, and batch data processing.

The developmental effort of WIS-SIM includes both batch and on-line implementations. On-line systems have great appeal in this application because the turn-around time, the time required to enter data and receive reports, is minimized. Batch systems require combinations of telephone calls, mail, and courier service in order to request reports, receive reports, and update the computer files. Courier service is faster than mail but implementing and maintaining a courier service presents unique administrative problems. Batch implementation will continue to be given significant attention in the design of WIS-SIM because batch systems are the most available to the nation's schools. In this year's pre-tests of WIS-SIM, we are attempting to determine acceptable turn-around times for various functions and we are collecting data which should be helpful in establishing optimum courier service for various types of environments.

Most systems of individualized instruction, whether intended for local or national implementation, follow essentially a "file-folder" approach. That is, the student takes a pre-test and depending upon his performance is either given additional tests or is given material relating to one or a few closely related instructional objectives. This material may literally be contained in a single folder or the student may be given one or more sheets which outline the instructional objectives, reference the required material, and indicate when the student should seek assistance from the teacher and take tests. In the file folder approach to individualization, the student essentially works by himself using a combination of specially prepared materials and

conventional textbooks, workbooks, and audiovisual material. There are some file folder systems that make provision for occasional work with a partner and/or tutoring of slow students by more advanced students. However, in general, file folder approaches to individualization are characterized by students working by themselves and going from pre-test to prescribed instruction to post-test. Another common characteristic of the file folder approach to individualization is that the essential organizational structure of the age-graded self-contained classroom remains intact. That is, there is one teacher who is more or less responsible for the instruction of 20 to 35 students..

Individually Guided Education (IGE)[2] presents several striking contrasts to both the self-contained classroom and the file folder approach to individualization. IGE incorporates several innovative practices including continuous progress (nongraded), a system of instructional programming, team teaching, differentiated staffing and decision-making at the building level. Thus, in IGE instead of having one teacher who is more or less responsible for 20 to 35 students, we have 3 to 5 teachers who work as a team to guide the education of 100 to 150 students which make up an instructional unit. IGE attempts to meet the needs of individual students by establishing appropriately sized instructional groups. Such factors as the nature of the instructional material and student and teacher characteristics are involved in identifying instructional groups and establishing group size. Thus, while group teaching is characteristic of traditional classrooms and students working by themselves is characteristic of file folder

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[2]Klausmeier, H. J., Quilling, M. R., Sorenson, J. S., Way, R. S., & Glasrud, G. R. Individually Guided Education and the Multiunit Elementary School: Guidelines for Implementation. Madison: Wisconsin Research and Development Center for Cognitive Learning, 1971.

approaches to individualization, instruction in IGE takes place in various sized groups, from large group instruction to individual work, with the small to medium sized group being the most common.

The establishment of instructional groups for the unit in the various subject areas is generally accomplished in two steps. First, the unit leader or another teacher assesses overall instructional needs of the students in the unit by examining "Unit Performance Profiles" for the various subject areas under consideration. Figure 1 illustrates part of such a report. The "Unit Performance Profile" summarizes for each student in the unit his past performance in that subject area. After assessing the overall status of the students in the unit, a number of instructional groupings are requested from the computer. These grouping recommendations will be considered at a meeting of the teachers of the unit.

Grouping recommendations are obtained by means of a "Grouping Request" form which is illustrated in Figure 2. Note that with the form illustrated, groupings can be requested for either the Reading Program (Word Attack, Study Skills, or Comprehension) or the Math Program (Developing Mathematical Processes). Also note that the form accommodates multiple requests for instructional groupings. When the form is completed by the unit leader or another teacher, it is given to a teacher aide who either telephones in the request to the computer center or enters the request via the keyboard of the school terminal; the mode of transmission is dependent upon whether the school's CMI system is being supported by a batch computer configuration or whether the school is supported by an on-line computer capability.

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

PERFORMANCE PROFILE: UNIT RECORD PAGE 1
UNIT A GEORGE WASHINGTON ELEMENTARY SCHOOL AS OF 08-05-74

ANDERSON

STUDENT NO./NAME	WORD ATTACK SKILLS — LEVEL A — 1	2	3	4	5	6	7	ALL A
0100 ANDREWS ANDY A	----------				----------			M
0200 BARRYMORE BARRY B		33			27	NM		
0300 CHAMPLAIN CHARLIE C	----------				----------			M
0400 DUNCAN DONALD D	M			55	M	NM	M	
0500 ELLSWORTH ELLIE E								
0600 FARMINGTON FRANCIS F	M	M	M	44	M	M		
0700 GABRIEL GLORIA G	----------				----------			M
0800 HARRISON HARRY H	32	27				NM		
0900 INGLEWOOD ISAAC I								
1000 JOHNSTON JONATHAN J	----------				----------			M
1100 KORBLETOES KATE K	----------				----------			M
1200 LEMMONWORTH LEONARD L								

Figure 1 "Unit Performance Profile"

GROUPING REQUEST

SCHOOL _____ DATE _____

UNIT _____ TEACHER _____

Area (WA, SS, COMP, DMP) Level & Skill _____
Topic

Area (WA, SS, COMP, DMP) Level & Skill _____
Topic

Area (WA, SS, COMP, DMP) Level & Skill _____
Topic

Area (WA, SS, COMP, DMP) Level & Skill _____
Topic

Area (WA, SS, COMP, DMP) Level & Skill _____
Topic

_____

_____

_____

_____

R & D Telephone (608) 263-4333 or 263-4347

Figure 2 Grouping Request Form

The grouping recommendations are evaluated by the unit teachers who meet to establish instructional groups. The grouping recommendations actually consist of three parts. For each instructional group (skill or topic) that was requested, there is an "Instructional Grouping Recommendation," (see Figure 3) which, in addition to listing the students that are eligible,also indicates any previous experience the student may have had with the instructional objectives. The second part of the Instructional Grouping Recommendation is an intersection report, "Students Who Are Eligible for Multiple Skills" (see Figure 4). The third part of the grouping recommendation report is the "Instructional Grouping Omissions" (see Figure 5) which lists students who did not qualify for any of the requested instructional groups. Students fail to qualify either because they have not mastered the necessary prerequisites or because they have already mastered the topic.

In addition to the three part grouping report, reports are available to the unit teachers in order to establish instructional groups to meet the needs of students not included in the "Instructional Grouping Recommendation." The "Topic Deficiency Report" (see Figure 6) lists the specific prerequisite deficiencies which prevented individual students from qualifying for placement in a particular instructional group. If more complete performance history is required on a particular student, an "Individual Performance Profile" (see Figure 7) may be requested. The "Individual Performance Profile," however, is most widely used in student-teacher and parent-teacher conferences.

These reports from the Wisconsin System of Instructional Management (WIS-SIM) illustrate a significant emphasis in IGE; that is, the establishment of appropriate instructional groups to meet student needs.

Figure 3 Instructional Grouping Recommendation

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

INSTRUCTIONAL GROUPING RECOMMENDATION: PAGE 1

UNIT B GEORGE WASHINGTON ELEMENTARY SCHOOL AS OF 10-01-74

WORD ATTACK SKILL -- B-06 RHYMING ELEMENTS

PREREQUISITE MASTERY: 6 OR MORE 'A' SKILLS

STUDENT NO	NAME	ATTEMPTS	LAST ATTEMPT	LAST %
1640	ANDREWS, ANDY	0		
1900	ELLSWORTH, ELLIE	0		
1930	FORD, LINCOLN	2	SEPT 74	40
1940	HARRISON, HARVEY	0		
1690	INGLEWOOD, ISAAC	1	AUG 74	60
1460	JOHNSON, PATRICIA	0		
1970	KELLY, KARL	0		
↓				
3150	ZING, ZELDA	0		

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

STUDENTS WHO ARE ELIGIBLE FOR MULTIPLE SKILLS PAGE 1

UNIT B GEORGE WASHINGTON ELEMENTARY SCHOOL AS OF 10-01-74

STUDENT NO. - NAME	SKILLS
1630 AARDVARK, AARON	A-B-09 A-D-03 A-D-05
1640 ANDREWS, ANDY	A-B-06 A-B-07 A-B-09
2140 CHAPLAN, CHARLIE	A-C-12 A-C-16
1930 HANSON, HANNAH	A-B-06 A-B-09
1690 INGLEWOOD, ISAAC	A-B-06 A-B-07 A-B-09
1470 LEMMONWORTH, LEON	A-C-04 A-C-16

Figure 4 Students Who Are Eligible for Multiple Skills

WISCONSIN DESIGN FOR READING SKILL DEVELOPMENT

INSTRUCTIONAL GROUPING OMISSIONS PAGE 1

UNIT B GEORGE WASHINGTON ELEMENTARY SCHOOL AS OF 10-01-74

STUDENTS NOT INCLUDED IN THE GROUPING RECOMMENDATIONS FOR THE FOLLOWING 8 SKILLS:

WORD ATTACK SKILL ----- B-06 RHYMING ELEMENTS
WORD ATTACK SKILL ----- B-07 SHORT VOWELS
WORD ATTACK SKILL ----- B-09 COMPOUND WORDS
WORD ATTACK SKILL ----- C-12 CONSONANT DIGRAPHS
WORD ATTACK SKILL ----- C-04 LONG VOWELS
WORD ATTACK SKILL ----- C-16 SYNONYMS, ANTONYMS
WORD ATTACK SKILL ----- D-03 SILENT LETTERS
WORD ATTACK SKILL ----- D-05 ACCENT

1580 DYLAN, BOB
1850 MORGANFIELD, MCKINLEY
1880 TROUBLESOME, TORRANCE
1660 WADSWORTH, WILL

Figure 5 Instructional Grouping Omissions

Figure 6 Topic Deficiency Report

TOPIC DEFICIENCY REPORT FOR UNIT C

THE FOLLOWING PUPILS ARE NOT READY FOR TOPIC 38 BECAUSE ACHIEVEMENT NOT ASSESSED (NA) OR INSUFFICIENT (N). NO MARK INDICATES SUFFICIENT ACHIEVEMENT (M OR P).

TOPIC	33							35		
NAME / OBJECTIVE	1	2	3	4	5	6	7	1	2	3
BELL, JOANNE	NA	NA	NA	NA	NA	NA	NA			
BENNETT, JOHN	N		N	N	N			NA	NA	
BRIGGS, HOWARD		N		N				N	N	N
BROGLEY, LAURA	NA	NA	NA					N	N	N
DOUGLAS, GENEVA	N	N	N	NA	NA	NA	NA			
CHAMBERS, GILBERT								N		
DEAN, DONALD		N		N						
HANSEN, ED	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
LEASH, BARBARA		N								
MILNE, KRISTIN	N		N		N			N	N	N
SPACKMAN, BARB	N	N	N	N	N	N	N	N	N	N
WENDELL, JOHN										

Figure 7 Individual Performance Profile

DEVELOPING MATHEMATICAL PROCESSES

PERFORMANCE PROFILE: INDIVIDUAL STUDENT PAGE 1
UNIT A GEORGE WASHINGTON ELEMENTARY SCHOOL AS OF 08-05-74

KORBLETOES KATE K

TOPIC 11 REPRESENTING NUMEROUSNESS PICTORALLY

OBJECTIVE 1 -- REPRESENTS NUMEROUSNESS PICTORALLY
05-21-74 M 04-28-74 P 04-22-74 P 04-01-74 N

OBJECTIVE 2 -- USES PICTORIAL REPRESENTATIONS TO COMPARE AND ORDER SETS
05-27-74 M 05-07-74 P 04-26-74 N 04-23-74 P
04-03-74 N

TOPIC 12 TALLYING

OBJECTIVE 1 -- TALLIES
03-26-74 M 03-22-74 N

TOPIC 13 TIME
NOT YET ASSESSED ON ANY OBJECTIVE

TOPIC 14 REPRESENTING NUMEROUSNESS SYMBOLICALLY

OBJECTIVE 1 -- STATES NUMBER FOR SET
12-15-73 M 12-01-73 P 11-27-73 N

OBJECTIVE 2 -- REPRESENTS NUMBER
NOT YET ASSESSED ON THIS OBJECTIVE

OBJECTIVE 3 -- READS NUMBER
12-18-73 P 12-02-73 N

OBJECTIVE 4 -- CHOOSES NUMBER FOR SET
NOT YET ASSESSED ON THIS OBJECTIVE

Although children do work by themselves in IGE, much of the instruction takes place in small to medium sized groups of common needs. Thus, IGE attempts to capitalize on the motivational and social forces at work when children with similar educational needs work together. In addition, proponents of IGE strongly believe that such group interaction is the most effective way of learning certain concepts.

The reports presented here are by no means exhaustive of the reports available in WIS-SIM. Also fairly unique to WIS-SIM are a series of reports which establish, monitor, and update instructional expectations for individual students in accordance with the Instructional Programming Model of IGE. Periodically the reports are updated so that teachers, students, and parents can observe progress toward instructional goals. Marked departures from expectations trigger the generation of "Management by Exception" reports.

In conclusion, we should note that the preceding discussion, although not exhaustive of WIS-SIM reports, does illustrate the emphasis in IGE of group decision-making by the teachers in the instructional unit. In addition to this significant departure from the organizational structure of the self-contained classroom, IGE also differs from most approaches to individualization in that the student is not required to spend a major part of the day working alone.